

What Is Claimed Is:

1                   1.       A static attitude measurement device for measuring the static  
2       attitude of a head suspension target while reducing measurement errors due to stray  
3       spots and internal reflections, the device comprising:  
4                         a light source for producing a light beam;  
5                         a beam splitter for directing a first portion of the light beam  
6       toward a target from which a reflected beam is returned;  
7                         a detector for detecting the reflected beam at a predetermined  
8       polarization state; and  
9                         a polarization component for producing the predetermined  
10       polarization state in the reflected beam, the polarization component positioned  
11       between the beam splitter and the target.

1                   2.       The measurement device of claim 1, wherein the polarization  
2       component comprises a quarter-wave plate.

1                   3.       The measurement device of claim 2, wherein the beam  
2       splitter comprises a first beam splitter and the device further comprises a second  
3       beam splitter position between the light source and the first beam splitter.

1                   4.       The measurement device of claim 3, wherein the second  
2       beam splitter comprises a polarizing beam splitter.

1                   5.       The measurement device of claim 3, wherein the first beam  
2       splitter comprises a polarizing beam splitter.

1                   6.       The measurement device of claim 3, further comprising a  
2       polarizer positioned between the first and second beam splitters.

1                   7.     The measurement device of claim 6, further comprising a  
2 beam reducer positioned between the first beam splitter and the polarizer.

1                   8.     The measurement device of claim 1, further comprising  
2 collection optics positioned between the beam splitter and the quarter-wave plate,  
3 the collection optics including at least one lens for focusing the first portion of the  
4 beam.

1                   9.     The measurement device of claim 1, wherein the beam  
2 splitter is positioned between the target and the detector.

1                   10.    The measurement device of claim 1, wherein the static  
2 attitude measurement device also measures Z-height of the target and wherein the  
3 device further comprises:  
4                               a Z-height detector for detecting a Z-height reflected beam;  
5 and  
6                               a Z-height directional component for directing a second  
7 portion of the light beam toward the target from which the reflected beam from the  
8 target is directed toward the Z-height detector.

1                   11.    The measurement device of claim 10, further comprising a  
2 polarization component positioned between the Z-height directional component  
3 and the target for changing the polarization state of the second portion of the light  
4 beam prior to encountering the target.

1                   12.    The measurement device of claim 1, wherein the light source  
2 comprises a polarized laser.

1 13. The measurement device of claim 1, wherein the detector  
2 comprises a polarizer that passes substantially only light in the predetermined  
3 polarization state.

1 14. A method for measuring the static attitude of a head  
2 suspension target while reducing measurement errors due to stray spots and  
3 internal reflections, the method comprising the steps of:  
4 providing a light beam;  
5 directing the beam onto a target from which a reflected beam  
6 is returned;  
7 producing a predetermined polarization state in the reflected  
8 beam by passing the beam and the reflected beam through a first polarization  
9 component; and  
10 detecting the reflected beam at the predetermined  
11 polarization state.

1 15. The method of claim 14, wherein the step of detecting  
2 comprises providing a detector that detects the reflected beam at the predetermined  
3 polarization state and providing a polarizer that passes substantially only light in  
4 the predetermined polarization state.

1 16. The method of claim 14, wherein the first polarization  
2 component comprises a quarter-wave plate through which the beam and reflected  
3 beam are passed to produce a predetermined polarization state in the reflected  
4 beam that is orthogonally polarized with respect to a polarization state of the beam.

1 17. The method of claim 14, wherein the step of directing  
2 comprises passing the beam through a beam splitter before encountering the target.

1 18. The method of claim 17, wherein the beam splitter comprises  
2 a polarizing beam splitter which passes substantially only light in the  
3 predetermined polarization state and reflects substantially all other light.

1 19. The method of claim 17, further comprising passing the beam  
2 through a polarizer positioned before beam splitter to substantially block light at  
3 undesired polarization states.

1 20. The method of claim 14, wherein the method is also for  
2 measuring the Z-height of the target, and wherein the method further comprises  
3 directing a portion of the beam onto the target from which a reflected Z-height  
4 beam is returned and detecting the reflected Z-height beam to determine the Z-  
5 height of the target.

1 21. The method of claim 20, further comprising the step of  
2 producing a desired polarization state in the reflected Z-height beam such that any  
3 reflected Z-height beam directed toward the detector for the static attitude  
4 measurement is not in the predetermined polarization state.

1 22. The method of claim 21, wherein the step of producing  
2 comprises passing the portion of the beam through a second polarization  
3 component before the portion of the beam encounters the target, such that any  
4 portion of the reflected Z-height beam directed toward the detector for the static  
5 attitude measurement also passes through the first polarization component  
6 producing a polarization state in the reflected Z-height beam that is substantially  
7 not the predetermined polarization state.

1                   23.     In a static attitude measurement device for measuring the  
2     static attitude of a head suspension target, the device including a light source for  
3     producing a light beam, first and second beam splitters for directing the light beam  
4     toward the target from which a reflected beam is returned, and a detector for  
5     detecting light at substantially only a predetermined polarization state with the  
6     detector positioned to intercept the reflected beam, the improvement comprising a  
7     quarter-wave plate positioned between the second beam splitter and the target for  
8     producing the predetermined polarization state in the reflected beam.

1                   24.     The improvement of claim 23, further comprising a polarizer  
2     positioned between the first and second beam splitters for reducing light in an  
3     unwanted polarization state from reaching the quarter-wave plate and the target.

1                   25.     In a combined static attitude and Z-height measurement  
2     device for measuring the static attitude and Z-height of a head suspension target,  
3     the device including a light source for producing a light beam, a first beam splitter  
4     for producing first and second portions of the light beam, a second beam splitter  
5     for directing the first portion of the light beam toward the target from which a  
6     static attitude reflected beam is returned, a first detector for detecting light at  
7     substantially only a predetermined polarization state with the detector positioned to  
8     intercept the static attitude reflected beam, at least one directional component for  
9     directing the second portion of the light beam toward the target from which a Z-  
10    height reflected beam is returned and a second detector positioned to intercept and  
11    detect the Z-height reflected beam, the improvement comprising:

12                         a first quarter-wave plate positioned between the second  
13    beam splitter and the target for producing the predetermined polarization state in  
14    the static attitude reflected beam; and

15                         a second quarter-wave plate positioned before the target for

16 producing a desired polarization state in the second portion of the light beam  
17 before it encounters the target.

1 26. The improvement of claim 25, further comprising a polarizer  
2 positioned between the first and second beam splitters for reducing light in an  
3 unwanted polarization state from reaching the first quarter-wave plate and the  
4 target.

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